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To the INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Dear Sirs,

RE: International Patent Application No. PCT/FI 2003/000219

Applicant: M-REAL OYJ et al.

With reference to the first Written Opinion of the IPEA dated 6 February 2004, we present the following comments:

According to the Written Opinion it is known from D1 (SE 9892396-3 A) to classify wood material to be used in the manufacture of pulp and paper. The classification was stated to be based on circumstances, such as width of the annual rings and the age of the tree, from which the fibre dimensions were dependent. Since it is well-known that the age of a tree can be determined by the number of annual rings, it was considered to be obvious to a person skilled in the art, with the knowledge that the age of a tree has an influence on the fibre dimensions, to classify wood material according to the number of annual rings.

According to the Written Opinion the claimed invention is obvious also from D2 (US 2001/0018308), which discloses that wood material with a certain fibre coarseness can be sorted out on the basis of the age of the tree.

The claims in the present application are directed to a method for adjusting the fibrous properties of pulp to a preselected level. According to the method in the manufacture of the pulp, a wood material is used, which is classified by log or group of logs according to the number of annual rings into categories that represent a certain fibre dimension property. The claims are also directed to a method for manufacturing pulp that has preselected fibre dimension properties and to a method for manufacturing a fibrous product that has preselected fibre dimension properties.

The present invention is based on the finding that the fibre length of wood material obtained from different parts of wood is different. Based on this it was found that the number of annual rings of a tree has an impact on the tree's fibre length. When the wood material is classified into categories according to the number of annual rings, and wood material is taken from a certain category, a wood material with a homogenous fibre length is obtained. It is essential for the invention that the wood material is studied "by log" or by "groups of logs". By "log" is meant the cut parts of a harvested wood. When logs are known to be close to one another in terms of the numbers of annual rings, "by groups of logs" correspondingly refers to a group of two or more logs. According to the method of the present invention the number of annual rings is determined for each cut part of a harvested tree or for a group of cut parts.

A remarkable advantage of the present invention is that the classification of the wood material according to the number of annual rings can be carried out mechanically or by modeling. The classification can be carried out at any processing stage after felling the tree and before pulping (when making chemical pulp) or after felling the tree and before grinding (when making any pulping, mechanical or chemi-mechanical or chemical pulp). It

is preferable to define the number of annual rings as early as at the cutting machine in the forest in connection with felling the wood, since it decreases the need to classify the logs at a later stage. The most remarkable advantage of the method of the present invention is that when the raw material is classified into different categories according to the number of annual rings, certain desired fibre lengths and dimensions as well as extraordinary smoothness levels are achieved. This can be seen in the examples 1, 3, 5, 7 and 9 and in Figures 1, 3, 5, 7 and 9. When the cut trees were classified according to the diameter the fibre lengths and the fibre coarsenesses were partly or fully overlapping and the classification by diameter did not have any significance in practice. This can be seen in Examples 2, 4, 6, 8 and 10 and in Figures 2, 4, 6, 8 and 10. This was true although the logs were classified logwise.

The cited reference D1 suggests that wood material is classified by calculating classification variables for a log or a bigger bundle of logs as regression expression specific for a sort of wood and for a part of a country. The regression expression comprises average width of annual rings in a bundle weighted by volume, average diameter in a bundle weighted by volume and average elevation above sea level on the original growing place of the tree. The age of a tree is mentioned as an alternative for measuring the width of annual rings, but age was not used in the regression expression. In addition, the average values were not calculated, instead, the measurer chose an average log in a bundle for measure. The classification method of D1 is very complicated and needs much work before it can be carried out. The constants specific for a sort of wood and for a part of a country must be determined, the width of annual rings and the diameter of logs should be measured. The evaluation of a log to have average width of annual rings in a bundle or have average diameter in a bundle was subjective. The method of the present invention is much simpler and reliable. As discussed above, the diameter can not be used in practice to classify wood material, since the categories obtained will overlap each other. The method of the present invention is highly reliable since the number of annual rings of each cut part or nearly each cut part is determined.

D2 relates to a densifyable wood pulp product. The densifyable product may include fibers having low coarseness, preferably having a fiber coarseness less than about 22 mg/100 m, and a densifying agent. In another embodiment, the densifyable product further includes fibers having coarseness greater than about 22 mg/100 m. It was discovered that a fibre coarseness of less than 22 mg/100 m could be reached by using treetops and wood from thinning. However, the publication neither examined the number of the trees' annual rings by log or groups of logs, nor divided the wood material into categories according to the number of annual rings. The wood was roughly divided into grown wood and young wood only and it was considered that the desired fibre coarseness would be reached in this way by taking some young wood or grown wood or both in certain proportions.

The problem to be solved in the present invention was how to improve the quality of wood material and decrease the variation of fibre dimensions in the wood material used in pulp manufacture. According to the invention the problem was solved by using in the manufacture of pulp wood material classified according to the number of annual rings by log or groups of logs into categories that represent a certain fibre dimension property. The solution of the present invention was not obvious for a person skilled in the art in view of the cited documents D1 and/or D2.

Favorable consideration of the present application is respectfully solicited.

Yours faithfully,  
SEppo LAINE OY

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